UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/578,564	05/25/2000	Victor Firoiu	2204/A05	6201

34845 7590 06/23/2004

STEUBING AND MCGUINESS & MANARAS LLP
125 NAGOG PARK
ACTON, MA 01720

EXAMINER	
RYMAN, DANIEL J	

ART UNIT	PAPER NUMBER
2665	20

DATE MAILED: 06/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/578,564	Applicant(s) FIROIU ET AL.	
	Examiner Daniel J. Ryman	Art Unit 2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☒ Claim(s) *15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 10-27 have been considered but are moot in view of the new ground(s) of rejection.

2. Applicant's arguments filed 1/23/2004 have been fully considered but they are not persuasive with respect to claims 1-9. On page 2 of the Response, Applicant argues that Floyd does not disclose "automatically recalculating the control function during operation". Examiner, respectfully, disagrees. Floyd teaches that the probability (control function) can vary in time in response to variations in the average size of the queue (pages 400-401, section 4). As such, as broadly defined, Examiner submits that Floyd teaches automatically recalculating the control function during operation.

3. Given the above arguments, Examiner maintains the rejection of claims 1-9. Examiner urges Applicant to amend the claims to add further limitations which will distinguish the claims from the prior art.

Claim Objections

4. Claim 15 is objected to because of the following informalities: in line 2 "the method comprising" should be "the apparatus comprising". Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 10-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Independent claims 10-12, 15-17, 23, 26, and 27 were amended to add the limitation (or variations thereof) "recalculating the control function at points in time selected based, at least in part, upon input data concerning traffic characteristics". Examiner has interpreted this limitation to mean that the update interval of the control function is governed by a function which contains, as one of its variables, traffic characteristics. Applicant has cited pages 6-7 and 12 to support the addition of this limitation. Upon reviewing the specification, Examiner cannot find any mention that the control function is updated at an interval selected using input data concerning traffic characteristics. As such, the limitations added by amendment are new matter. Examiner requests that Applicant either cancel the limitations added by amendment or provide further evidence that the aforementioned limitations are supported by the specification.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Floyd et al (Floyd S et al. "Random Early Detection Gateways for Congestion Avoidance". IEEE/ACM

Transactions on Networking, IEEE Inc. New York, US. vol. 1, no. 4, 1 August 1993. pages 397-413).

9. Regarding claim 7, Floyd discloses a method for reducing oscillations in queue size in a link using congestion control process that operates in a TCP environment (pages 400-401, section 4 and pages 405-407, section 8, esp. page 406), the method comprising: determining a queue law function (average queue size algorithm) defining an average queue size for a link (pages 400-401, section 4 and pages 403-404, section 6); based at least upon a drop probability characteristic of the congestion control process defining a control function for the queue (packet marking algorithm) which identifies a drop probability of the congestion control process across a range of average queue sizes (pages 400-401, section 4 and pages 404-405, section 7); dropping packets from the queue at a packet drop rate defined at a point of intersection for the control function and the queue law function (pages 400-401, section 4; pages 403-404, section 6; and pages 404-405, section 7); and redefining the control function at various points in time during operation (pages 400-401, section 4; pages 403-404, section 6; and pages 404-405, section 7) where the value of the probability varies in time indicating that the control function is recalculated during operation.

10. Regarding claim 8, referring to claim 7, Floyd discloses in the step of defining the control function, the control function is further defined as a function having no discontinuities (pages 400-401, section 4 and pages 404-405, section 7).

11. Regarding claim 9, referring to claim 7, Floyd discloses that the control function is piecewise linear (pages 400-401, section 4 and pages 404-405, section 7).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Floyd et al (Floyd S et al. "Random Early Detection Gateways for Congestion Avoidance". IEEE/ACM Transactions on Networking, IEEE Inc. New York, US. vol. 1, no. 4, 1 August 1993. pages 397-413) in view of Lauer (USPN 5,528,591).

14. Regarding claim 1, Floyd discloses a method for controlling a transmission rate of packets in response to a calculated drop probability of the packets at a queue in a receiving node includes the steps of: systematically calculating a weight for determining a weighted moving average fullness of the queue in a node (pages 400-401, section 4 and pages 403-404, section 6); calculating the weighted moving average (pages 400-401, section 4); determining an average queue size based upon the weighted moving average (pages 400-401, section 4); and evaluating a control function using the average queue size (pages 400-401, section 4), the control function defining a drop behavior of packets at the node for a range of average queue sizes as defined by a congestion control process executing at the node to determine the drop probability with regard to the average queue size (pages 400-401, section 4) where the function used to derive the probability, *pa*, using the average queue size, *avg*, is broadly defined to be the control function and where the dropping of packets is also broadly defined to be a congestion control process; and automatically recalculating the control function during operation (pages 400-401, section 4)

where the value of *pa* varies in time indicating that the control function is recalculated during operation. Floyd does not expressly disclose controlling a transmission rate of packets issued by a sender in response to a calculated drop probability of the packets at a queue in a receiving node by feeding the calculated drop probability back to the sender. Lauer teaches, in a system for controlling congestion in a network, controlling a transmission rate of packets issued by a sender in response to a feedback information that reflects the ability of downstream nodes to receive data without loss by feeding the calculated rate back to the sender in order to reduce the complexity of the intermediate switches (col. 3, lines 36-67). It would have been obvious to one of ordinary skill in the art at the time of the invention to control a transmission rate of packets issued by a sender in response to a calculated drop probability (ability of a downstream node to receive data without loss) of the packets at a queue in a receiving node by feeding the calculated drop probability back to the sender in order to reduce the complexity of the intermediate switches.

15. Regarding claim 2, referring to claim 1, Floyd in view of Lauer discloses that systematically calculating a weight comprises: determining a sampling period for measuring the queue size (Floyd: pages 400-401, section 4; pages 403-404, section 6; pages 405-407, section 8); determining a time period for which samples significantly contribute to the average queue size (Floyd: pages 400-401, section 4; pages 403-404, section 6; pages 405-407, section 8); and determining the weight based upon the sampling period and the time period (Floyd: pages 400-401, section 4; pages 403-404, section 6; pages 405-407, section 8).

16. Regarding claim 3, referring to claim 1, Floyd in view of Lauer discloses that evaluating a control function comprises: determining a queue function based upon predetermined system

parameters (average queue size algorithm) (Floyd: pages 400-401, section 4); and determining the control function based upon the queue function (packet marking probability algorithm) (Floyd: pages 400-401, section 4 and pages 404-405, section 7).

17. Regarding claim 4, referring to claim 3, Floyd in view of Lauer discloses that determining the control function further comprises: determining a threshold value based upon the queue policy (Floyd: pages 400-401, section 4; pages 403-404, section 6; and pages 404-405, section 7); determining a maximum point based upon the threshold value, wherein the maximum point is outside of the queue function (Floyd: pages 400-401, section 4; pages 403-404, section 6; pages 404-405, section 7; and pages 405-407, section 8, esp. page 406, subsection 3); selecting the control function such that when the control function is evaluated a point passes through the maximum point (Floyd: pages 400-401, section 4; pages 403-404, section 6; pages 404-405, section 7; and pages 405-407, section 8, esp. page 406). Floyd in view of Lauer does not expressly disclose selecting a queue policy; however, Floyd in view of Lauer suggests this by disclosing that "the average queue size which makes the desired tradeoffs (such as the tradeoff between maximizing throughput and minimizing delay) depends on network characteristics, and is left as a question for further research" (Floyd: pages 400-401, section 4, esp. page 401, lower half of col. 1), where the queuing policy would be chosen based upon the network characteristics. It would have been obvious to one of ordinary skill in the art at the time of the invention to select a queuing policy in order to make desired tradeoffs between maximizing throughput and minimizing delay depending on network characteristics. Further, Floyd in view of Lauer does not expressly disclose that the method is implemented in a computer program;

however, Examiner takes official notice that computer programs are a well-known way to implement methods since computer programs are very flexible.

18. Regarding claim 5, referring to claim 4, Floyd in view of Lauer suggests that the queue policy is a delay conservative policy and wherein determining a threshold value comprises: determining a maximum value for the average queue size (Floyd: pages 400-401, section 4; pages 403-404, section 6; pages 404-405, section 7; and pages 405-407, section 8, esp. page 406).

19. Regarding claim 6, referring to claim 4, Floyd in view of Lauer discloses that the queue policy is a drop conservative policy and wherein determining a threshold value comprises: determining a maximum value for the drop probability (Floyd: pages 400-401, section 4; pages 403-404, section 6; pages 404-405, section 7; and pages 405-407, section 8, esp. page 406).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Des Jardins et al. (USPN 5,936,939) see col. 9, line 66-col. 10, line 24, esp. col. 10, lines 18-24 which teaches in a random early discard system, recalculating the control function (threshold levels which affect the probability calculation) at various points in time selected based, at least in part, upon input data concerning traffic characteristics (line rate) where Des Jardin discloses changing a value of "k" which affects the time between updates of a threshold, which in turn affects the probability calculation, in accordance with a line rate in order to have the updates reflect changes in cell traffic.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (703)305-6970. The examiner can normally be reached on Mon.-Fri. 7:00-5:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703)308-6602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel J. Ryman
Examiner
Art Unit 2665

DJR

Daniel J. Ryman

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600